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THE
ONTARIO WATER RESOURCES
COMMISSION
WATER POLLUTION SURVEY
of the
TOWN OF STURGEON FALLS

1965

TOWN OF STURGEON FALLS 1965
DISTRICT OF NIPISSING

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ONTARIO WATER RESOURCES COMMISSION

REPORT ON

A

WATER POLLUTION SURVEY

OF THE

TOWN

OF

STURGEON FALLS

AUGUST, 1965

THE DIVISION OF SANITARY ENGINEERING

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ONTARIO WATER RESOURCES COMMISSION

REPORT

INTRODUCTION

A water pollution survey was made of the Town of Sturgeon Falls on June 15, 1965. The purpose of this survey was to locate and record all significant sources of water pollution within the town. Such surveys are performed routinely, and upon request, by the Ontario Water Resources Commission as a basis for evaluating all existing and potential sources of pollution. Where sources of pollution are found, corrective action is requested by the Commission.

The information received from the town officials and personnel of the Abitibi Power and Paper Company Limited during this investigation is gratefully acknowledged.

I GENERAL INFORMATION

The Town of Sturgeon Falls is located within the Township of Springer in the District of Nipissing and covers an area of approximately 475 acres. The 1965 Municipal Directory listed the assessed population of the town at 6,690.

The Town of Sturgeon Falls is situated in a relatively flat terrain within the Sturgeon River watershed. The Sturgeon River flows through the town in a southwesterly direction towards Lake Nipissing.

The Abitibi Power and Paper Company Limited and the tourist trade are the principal sources of revenue.

II WATER USES

1. Municipal Water System

Water is obtained from the Sturgeon River through an 18-inch diameter cast iron intake pipe and flows by gravity into a circular intake well. The water is chlorinated and pumped through three pressure filters to the distribution system. Storage is provided by a 125,000 gallon elevated tank. The average daily water consumption for the town is approximately 539,000 gallons.

Bacteriological examinations of the samples, collected from the raw water during 1965, indicated the presence of coliform organisms. This reveals the need for adequate chlorination treatment. At the time of the last OWRC inspection on June 28, 1965, a chlorine residual of 0.2 ppm was obtained. It was recommended that the chlorine feed rate be increased to obtain a chlorine residual of 0.5 ppm.

2. Industrial Water Supply

Abitibi Power and Paper Company Limited

Water for potable purposes at this industry is obtained from the municipal water system. Water for industrial usage is pumped from the Sturgeon River. No consumption data could be obtained.

3. Recreational

The Sturgeon River which flows through the Town of Sturgeon Falls is noted for its fishing. Because of this, there exists a very active tourist trade during the summer months. The Sturgeon Falls public beach, located on the east shore of the Sturgeon River in the north section of town, has been considered by the local Medical Officer of Health as being unfit for swimming.

III WATER POLLUTION

1. Sanitary Waste Disposal

(a) Existing Conditions - About 80% of the town is serviced by a system of combined sewers discharging to the Sturgeon River. No treatment is provided.

In the southern section of the town, west of the Sturgeon River, domestic waste disposal is provided by private sewage disposal systems. It was reported at the time of this survey that a number of septic tank and subsurface tile bed systems were malfunctioning.

(b) Proposed Sewage Works - A sewage works programme has been initiated by the Town of Sturgeon Falls. The municipality has obtained a preliminary engineering report from Proctor and Redfern Consulting Engineers which includes the installation of several sewage pumping stations, trunk sewers, a waste stabilization pond and a storm relief sewer. The Ontario Municipal Board has

refused the town's application for the implementation of this sewage works programme.

Thus the plans to provide sewage treatment facilities for the Town of Sturgeon Falls remain temporarily inactive at this time.

2. Refuse Disposal

The refuse disposal site is located north of Sturgeon Falls on Lot 4, Concession 2, in the Township of Springer. It is a burn and cover type of dump. Because there are no watercourses in the vicinity of this disposal site, the site does not present a water pollution problem.

3. Industrial Waste Disposal

Abitibi Power and Paper Company Limited

The imposing mills of Abitibi Power and Paper Company Limited dominate the Sturgeon Falls area and are located on the banks of the Sturgeon River. The yearly productive capacity of this paper mill is over 90,000 tons of wood products such as hard-board and paper. It was estimated that 10,000,000 gallons of waste effluent are produced daily. Liquid processing wastes and the sanitary wastes from approximately 500 employees are discharged without treatment via separate sewers to the Sturgeon River.

Abitibi Power and Paper Company Limited reported that logs had not been floated on the Sturgeon River in the vicinity of Sturgeon Falls this year. Wood chips in the waste flow are retained

by a 1/8 inch mesh screening device.

4. Discussion of Sample Analyses

The laboratory results of the bacteriological examinations and the chemical analyses of samples collected from the watercourses and outfalls are included in Table I which is appended to this report. An outline of the OWRC objectives and descriptions of the tests are also appended.

Samples of the effluent discharging into the Sturgeon River from the municipal sewer system indicated that the 5-Day BOD and suspended solids content of the wastes were in excess of the OWRC recommended maximum objective of 15 ppm for both concentrations. These high levels are due to the fact that domestic wastes from the Town of Sturgeon Falls are discharged to the river without treatment. In addition, high coliform counts indicate fecal pollution.

The results of waste discharges from the Abitibi Power and Paper Company Limited proved to be in excess of the OWRC maximum objective of 15 ppm for 5-Day BOD and suspended solids concentrations.

A sample was taken from the outfall containing domestic wastes from the Sturgeon Hotel and other residences in the immediate vicinity. Results showed that the suspended solids content was in

excess of the OWRC maximum objective of 15 ppm. Also a high coliform count was obtained indicating fecal pollution.

A water sample taken from a small watercourse discharging to the Sturgeon River revealed a total coliform count of 240,000 per 100 ml. This is in excess of the Commission objective of not greater than 2400 coliform organisms per 100 ml.

The importance of instituting a Sewage Works Programme is reflected by the following table which compares the water quality of the Sturgeon River upstream and downstream from the dam site at the Abitibi Power and Paper Company Limited.

U P S T R E A M

<u>Sample Point No.</u>	<u>Location</u>	<u>5-Day BOD (ppm)</u>	<u>M.P.N. Total Coliform Organisms</u>
FS-78.1	Sturgeon River upstream from Sturgeon Falls.	1.1	230
FS-77.7	Sturgeon River Sturgeon Falls Public Beach	-	93

D O W N S T R E A M

<u>Sample Point No.</u>	<u>Location</u>	<u>5-Day BOD (ppm)</u>	<u>M.P.N. Total Coliform Organisms</u>
FS-76.2	Sturgeon River downstream from Sturgeon Falls.	2.0	15,000
FS-77.0	Sturgeon River opposite Queen St. sewer outfall.	8.2	240,000+

D O W N S T R E A M (CONTINUED)

<u>Sample Point No.</u>	<u>Location</u>	<u>5-Day BOD (ppm)</u>	<u>M. P. N. Total Coliform Organisms</u>
FS-76.6	Sturgeon River opposite Federal Wharf in Minne- Ha-Ha Bay.	2.8	24,000
FS-77.2	Sturgeon River below Abitibi Power and Paper Company Limited.	18.0	240,000+

The comparison reveals the deterioration of the water quality of the Sturgeon River. This water impairment is caused by the discharging of raw domestic wastes and industrial wastes to the river.

Complaints have been received from operators of tourist establishments regarding the unsightly condition of their beaches and docks due to the accumulation of raw sewage and wooden chips. The operators have reported a decrease in business on account of this conditon.

IV SUMMARY AND CONCLUSIONS.

A water pollution survey was carried out in the Town of Sturgeon Falls on June 15, 1965.

The Town of Sturgeon Falls has a municipal water supply. Water, obtained from the Sturgeon River, is chlorinated and filtered prior to being pumped to the distribution system.

The municipal refuse disposal site was satisfactory from a water pollution point of view at the time of the inspection.

The results of this survey indicate that improper sewage and industrial wastes disposal methods are being practised in the Town of Sturgeon Falls resulting in pollution of the Sturgeon River and its tributaries. The town does not have a sewage treatment plant. Raw sanitary wastes are discharged to the Sturgeon River via four outfalls from the combined sewer system. Where residences are not serviced by the sewer system, septic tank and tile bed systems are employed. Many of these systems are malfunctioning with the final effluent entering the Sturgeon River via small watercourses and open ditches.

Industrial wastes from the Abitibi Power and Paper Company Limited are also deteriorating the water quality of the Sturgeon River. It was reported that the Commission's previous recommendation to provide treatment for industrial wastes has been given consideration by the company. Data for the design of treatment facilities is being collected and preliminary design of the proposed industrial waste treatment facilities will be submitted to the OWRC this fall. It was anticipated that the sanitary wastes from the paper mill would be directed to the proposed municipal sewage treatment plant.

The Ontario Municipal Board, however, has not granted its approval for a sewage works project for the present time.

The discharge of polluting wastes to a watercourse is prohibited by the Ontario Water Resources Commission and action should be taken to correct this undesirable situation.

V RECOMMENDATIONS

1. The Town of Sturgeon Falls should endeavour to obtain waste treatment facilities. The discharge of polluting wastes from the municipal sewers to the Sturgeon River should be eliminated.

2. The Abitibi Power and Paper Company Limited should eliminate the discharge of polluting industrial wastes to the Sturgeon River.

3. The discharge of sanitary wastes from a private sanitary sewer owned by the Sturgeon Hotel should be eliminated.

All of which is respectfully submitted.

District Engineer

A. B. Redekopp
for A. B. Redekopp.

Approved by

J.R. Barr, Director,
Division of Sanitary Engineering.

bw

Prepared by:

G.K. Boretski.

APPENDIX

THE SIGNIFICANCE OF LABORATORY RESULTS

The OWRC objectives for surface waters in Ontario are as follows:

5-Day BOD - not greater than 4 ppm.
M.F. Coliform Count - not greater than 2400
coliforms per 100 ml

Phenolic Equivalents:

Average - not greater than 2 ppb.
Maximum - not greater than 5 ppb.
pH - 6.7 to 8.5

Adequate protection for these waters, except in specific instances influenced by local conditions, should be provided if the following waste discharge concentrations are obtained:

<u>ITEM</u>	<u>CONCENTRATION</u>
5-Day BOD	not greater than 15 ppm
Suspended Solids	not greater than 15 ppm
Phenol	not greater than 20 ppb
pH	5.5 to 10.6
Iron	not greater than 15 ppm
Oil	not greater than 15 ppm

EXPLANATION OF LABORATORY RESULTS

Bacteriological Examinations - The Most Probable Number Technique is used by the Ontario Department of Health to obtain an approximation of the actual number of coliform organisms present. These organisms are the normal inhabitants of the intestines of man and other warm-blooded animals. They are always present in large numbers in sewage and are, in general, relatively few in number in other stream pollutants.

Biochemical Oxygen Demand (BOD) - The biochemical oxygen demand test indicates the amount of oxygen required for stabilization of the decomposable organic matter found in sewage, sewage effluent, polluted waters, or industrial wastes, by aerobic biochemical action. The time and temperature used are five (5) days and 20°C, respectively.

Hydrogen Ion Concentration (pH) - The hydrogen Ion Concentration (pH value) of water indicates its relative acidity or alkalinity. A neutral water has a pH of 7.0. Higher values are in the alkaline range and the lower in the acid range.

Solids - The analyses for solids include tests for total, suspended, and dissolved solids. Total solids is a measure of the solids in solution and in suspension. Suspended solids indicate the measure of undissolved solids of organic or inorganic nature whereas the dissolved solids are a measure of those solids in solution.

Turbidity - Turbidity is a measure of the fine suspended solids in water, such as silt and finely divided organic matter. Where suspended solids values approach 20 parts per million or less, the results are usually reported as turbidity in silica units.

Oils and Ether Soluble Materials - These include oil and all other ether soluble materials such as tarry substances and greases. The presence of these pollutants renders water difficult and impractical to treat either for industrial or domestic use. Oils make streams unsightly and water unfit for bathing.

Phenolic Compounds - Phenols react with chlorine to produce intensely aromatic compounds. These compounds, even when highly diluted, may give a taste and odour to the water which is variously described as medicinal, chemical, or iodoform. Phenols taint fish and are toxic to fish, depending on the concentration. Normal water contains no phenolic compounds.

TABLE I

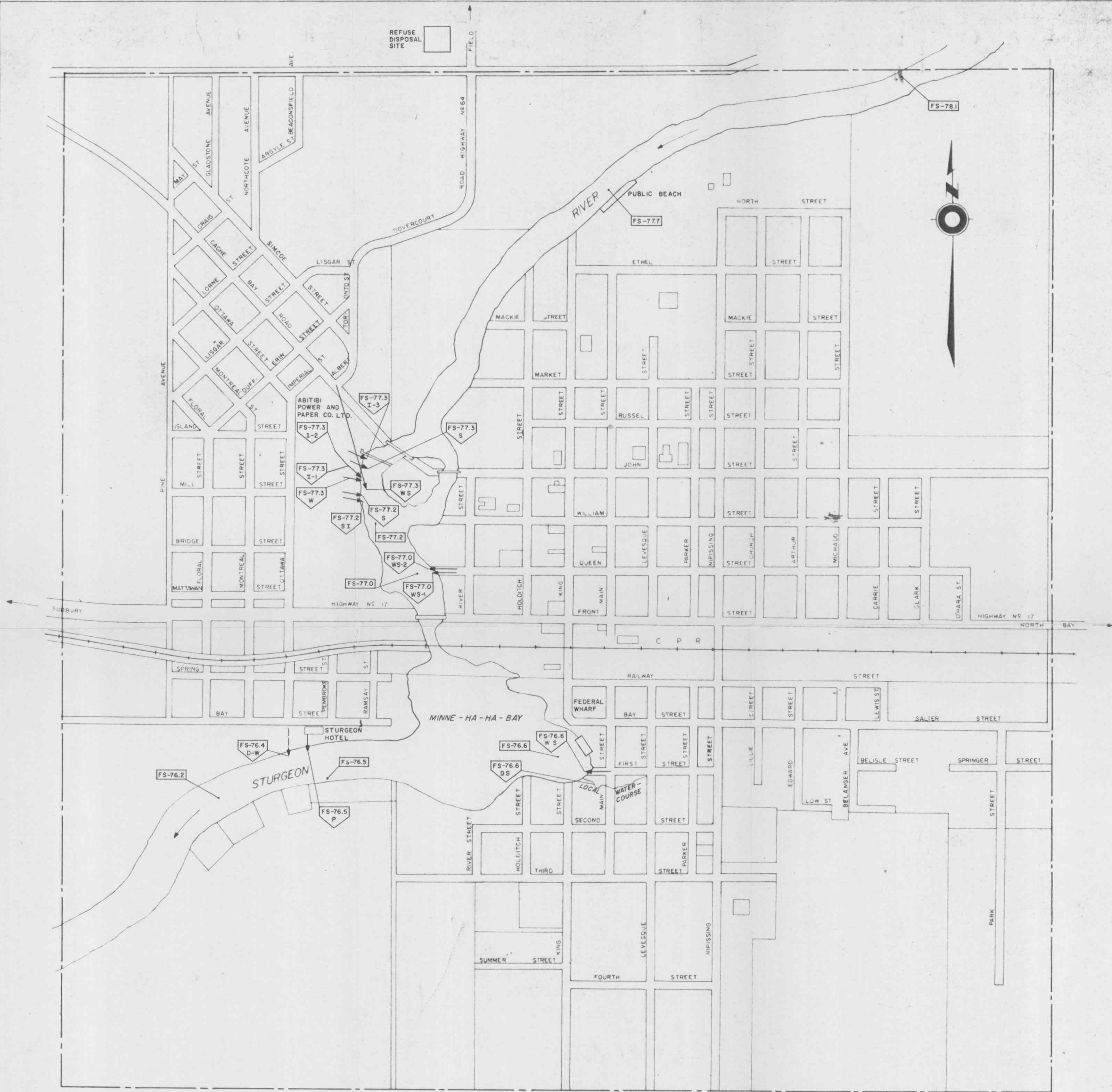
TOWN OF STURGEON FALLS

SAMPLING POINT NO.	LOCATION AND DESCRIPTION	DATE SAMPLED	5-DAY BOD (PPM)	S O L I D S (PPM)			PH AT LAB.	ACIDITY AS CaCO ₃	TOTAL COLIFORM COUNT PER 100 ML	E. COLI	FLOW
				TOTAL	SUSP.	DISS.					
FS-76.2	STURGEON R. DOWNSTREAM FROM STURGEON FALLS.	JUN.15/65.	2.0	50	12	38			15,000	9300	
FS-76.4 DW	OPEN DITCH CONTAINING WASH WATER.	JUN.15/65.		INSUFFICIENT FLOW							
FS-76.5 P	WASTE DISCHARGE FROM STURGEON HOTEL.	JUN.15/65.	6.6	102	44	58			240,000+	240,000+	
FS-76.5	STURGEON R. AT OLD MACDONALD'S FARM.	JUN.1/65.	4.6	52	15	37		* ETHER SOLUBLES - 7 PPM.		39+	
FS-76.6 DS	LOCAL WATERCOURSE DISCHARGING TO STURGEON R. SOUTH OF FIRST ST.	JUN.15/65.	42.0	310	46	264			240,000+	240,000+	
FS-76.6 WS	24" ϕ CORRUGATED COMBINED SEWER EFFLUENT AT MANHOLE ON FIRST ST.	JUN.15/65.	62.0	392	82	310			240,000+	240,000+	200 GPM
FS-76.6	STURGEON R. OPPOSITE FEDERAL WHARF IN MINNE-HA-HA BAY.	JUN.15/65.	2.8	44	8	36			24,000	2300	
FS-77.0 WS-1	14" ϕ CORRUGATED IRON COMBINED SEWER EFFLUENT AT QUEEN ST.	JUN.15/65.	170.0	438	152	286			240,000+	240,000+	400 GPM
FS-77.0 WS-2	COMBINED SEWER - SUBMERGED AT QUEEN ST.	JUN.15/65.		NOT SAMPLED							
FS-77.0	STURGEON R. OPPOSITE QUEEN ST. SEWER OUTFALL.	JUN.15/65.	8.2	74	21	53			240,000+	240,000+	

TABLE I (CONTINUED)

TOWN OF STURGEON FALLS

SAMPLING POINT NO.	LOCATION AND DESCRIPTION	DATE SAMPLED	5-DAY BOD (PPM)	S O L I D S (PPM)			PH AT LAB.	ACIDITY AS CaCO ₃	TOTAL COLIFORM COUNT PER 100 ML	E. COLI	FLOW
				TOTAL	SUSP.	DISS.					
FS-77.2	STURGEON R. BELOW ABITIBI POWER & PAPER CO. LTD.	JUN. 15/65.	18	128	10	118	6.7	8	240,000+	24,000	
FS-77.2 SI	24" ϕ WOODEN SANITARY SEWER 100' SOUTH OF ABITIBI POWER & PAPER CO. LTD.	JUN. 15/65.	4.6	84	61	23	6.6	8	110,000	24,000	75 GPM
FS-77.2 S	30" ϕ CONCRETE SANITARY SEWER FROM HARDBOARD MILL ABITIBI.	JUN. 15/65.	78.0	412	182	230	8.6	-	110,000	110,000	150 GPM
FS-77.3 W	STORM SEWER - ABITIBI POWER & PAPER CO. LTD.	JUN. 15/65.		NO FLOW NOTED							
FS-77.3 8-1	TWO HARDBOARD MILLS SEWER SAMPLED INSIDE ABITIBI.	JUN. 15/65.	740	834	370	464	5.9	50			6 GPM
FS-77.3	CORRUGATING MILL SEWER -ABITIBI.	JUN. 15/65.	2900	27,876	18,090	9,786	5.7	268			3 MGD
FS-77.3 S	POWERHOUSE SANITARY SEWER	JUN. 15/65.	0.4	32	5	27	7.5	2	93	0	1 GPM
FS-77.3 1-3	WASTE LIQUOR-ABITIBI.	JUN. 15/65.	62,000	217,000	6,040	211,340	6.8	7120			500+ GPM
FS-77.3 WS	24" ϕ CORRUGATED IRON COM- BINED SEWER EFFLUENT AT MANHOLE AT ALBERT & CACHE BAY RD. - SUBMERGED.	JUN. 15/65.	82	444	136	308			240,000+	240,000+	200 GPM
FS-77.7	STURGEON R.-PUBLIC BEACH	JUN. 15/65.							93	23	
FS-78.1	STURGEON R. UPSTREAM FROM STURGEON FALLS.	JUN. 15/65.	1.1	48	6	42	6.8	2	230	43	



LEGEND

- FS-76.2 - SAMPLING POINT SHOWING STREAM AND MILEAGE
- FS-76.5 P - STREAM AND MILEAGE AT OUTFALL
TYPE OF OUTFALL

OUTFALL SYMBOL LETTERS

- I - INDUSTRIAL WASTE EFFLUENT
- P - PRIVATE SEWER OUTFALL
- S - UNTREATED SEWAGE
- W - STORM SEWER
- D - DITCH, CREEK OR RIVER

ONTARIO WATER RESOURCES COMMISSION

TOWN OF STURGEON FALLS

WATER POLLUTION SURVEY

SCALE: 500 300 100 0 500 1000

DRAWN BY W.R.E.

DATE: AUGUST 1965

CHECKED BY R.W.

DRAWING No 65-95